CHAPTER 9. HELICOPTER OCEANIC OPERATIONS

1. GULF OF MEXICO.

*a. **Background.*** Although helicopter operations in the Gulf of Mexico have had an enviable safety record, recent statistics indicate that a significant rise in weather-related accidents has occurred. It is imperative that pilots performing oceanic (offshore) operations do not exceed the minimum weather criteria for visual flight rules (VFR) and instrument flight rules (IFR) flight or the minimum flight altitude parameters for all phases of flight. The operator must comply with all applicable minimum equipment requirements for the operation.

Two documents that address issues and requirements for improving rotorcraft operations within the National Airspace System are "Rotorcraft Terminal ATC Route Standards" (FAA/RD-90/18) and "Rotorcraft En Route ATC Route Standards" (FAA/RD-90-19). These documents are available to the public through the National Technical Information Service, Springfield, Virginia 22161. All operators should obtain these two documents and ensure that crews are familiar with the operating procedures discussed in these documents.

*b. **Flight in Environmentally Sensitive Areas.*** Protection of endangered species and the overflight of environmentally sensitive areas are of increasing concern in the Gulf of Mexico. Infringements by low flying airplanes and/or rotorcraft operating en route to airways in the Gulf of Mexico or to helidecks can be disruptive to wildlife while over the shore or near the shore. Guidelines for flights in these areas are contained in the Airman's Information Manual (AIM), in Advisory Circular (AC) 91-36 "VFR Flight Near Noise-Sensitive Areas," on VFR sectional maps, and on specially designed maps published by Minerals Management Service of the Department of the Interior.

2. IFR OFFSHORE OPERATIONS.

*a. **General.*** Any operator that desires to conduct IFR operations in uncontrolled airspace shall submit a letter describing the proposed operation to the certificate holding district office (CHDO). This letter should include the specific routes to be flown, the exact location of the destination, the type of aircraft to be used, the navigation equipment on the aircraft, and the specific navigational aids (navaids) to be used at the offshore facility, if any.

*b. **Offshore Operators.*** FAR Part 91 offshore operators are required to obtain a Letter of Authorization (LOA) for IFR operations. The LOA will be issued once all certification requirements are met.

*c. **FAA Coordination.*** After reviewing the request, the CHDO will arrange a coordination meeting with air traffic elements that will be involved (such as the center, approach control, flight service station (FSS), etc.). If a navaid exists at the offshore facility, the regional flight procedures branch may also be represented at the coordination meeting. If the proposed operations are to be conducted in a region other than that of the CHDO, the CHDO will coordinate with the FSDO having jurisdiction of the geographic area where operations are to be conducted. The jurisdictional flight standards district office (FSDO) will perform route checks and other required inspections, and forward reports of these inspections to the CHDO. When all requirements have been met, the CHDO approves the operation and issues operation specifications or an LOA.

*d. **Navigation Requirements and Procedures.*** Operators will be inspected to ensure that the required navigational equipment, including radar altimeter and mapping radar, is appropriately installed and approved for the proposed operation. If flight routes are predicated on the use of an area navigation (RNAV) system, operators should ensure that they are in compliance with AC 90-45, "Approval of Area Navigation Systems for use in the U.S. National Airspace System." An operator that seeks approval for IFR operations must ensure that the following navigation requirements are met.

*(1) **Route Requirements.*** Operators may develop proposed routes using Class I station-referenced navaids where adequate signal coverage is available. In areas where signal coverage is not available, the operator must provide a suitable means of Class II navigation. The FAA will require a validation test in VFR conditions to ensure that the operator is able to demonstrate adequate navigational performance for the route(s) before granting approval for use of the route(s).

(a) For approval of IFR operations using Class I navaids, appropriate approach plates and operating procedures must be approved by the FAA and published in the operator's manual. Use of the procedures will be authorized through a nonstandard operations specifications paragraph that refers to the operator's manual containing these procedures.

(b) For approval of IFR operations using nonterminal navaid facilities, the operator must submit a written request to the CHDO for a helicopter offshore procedure according to AC 90-80, "Approval of Offshore Helicopter Approaches."

*(2) **Extended Overwater or IFR Operations Equipment.*** All navigation equipment to be used in extended overwater or IFR operations must meet FAR 135.165(b) requirements. If positive course guidance for any portion of the route is obtained through the use of long-range navigation equipment such as very low frequency (VLF), Omega, or Loran-C, two independent receivers for navigation must be installed and be operative before approval is granted.

*e. **Weather Reporting Requirements.*** A weather reporting facility approved by the National Weather Service (NWS) or the FAA must be present and operable within 10 nautical miles (NM) of the destination. A remote source may be approved by the FAA (with NWS concurrence) as a deviation from the provisions of FAR 135.213(b) when the operator is able to demonstrate an adequate level of safety for the proposed operations. The approval for this deviation will be published in the operation specifications.

*f. **Helicopter En Route Descent Areas (HEDA).*** An operator that desires to establish a HEDA shall submit a written request to its CHDO. If the proposed HEDA is outside the CHDO's geographic area of responsibility, the CHDO will forward the request to the jurisdictional FSDO. The letter of request should include the following information:

(1) A pictorial and/or a written description of the proposed HEDA

(2) The means by which positive course guidance is to be established

(3) Equipment requirements for use in the HEDA

(4) Proposed operations and training manual revisions to incorporate HEDA's, if an initial application for approval of a HEDA

(5) The date of first intended use and the proposed length of service for which authorization is sought

*g. **HEDA Procedures and Requirements.*** Prior to granting authorization, the CHDO or jurisdictional FSDO will coordinate with a flight inspection procedures specialist to determine if the proposed HEDA is clear of obstructions and that positive course guidance is available for the entire route, including descent to the lowest authorized altitude (LAA). All required flight and navigation equipment must be installed and operative to utilize the 400-foot minimum. Figures 9-1 and 9-2 portray the en route dimensions contained in FAA Order 8260.3, "U.S. Standards for Terminal Instrument Procedures," that should be used to develop the primary and secondary areas for HEDA use. HEDA's have the profile of Figure 9-3 and the dimensions of the plan view as shown in Figure 9-4. The descent area begins at the descent fix and ends at the descent altitude fix. This area must be located over water and be free of obstacles.

*(1) **Inoperative Equipment.***

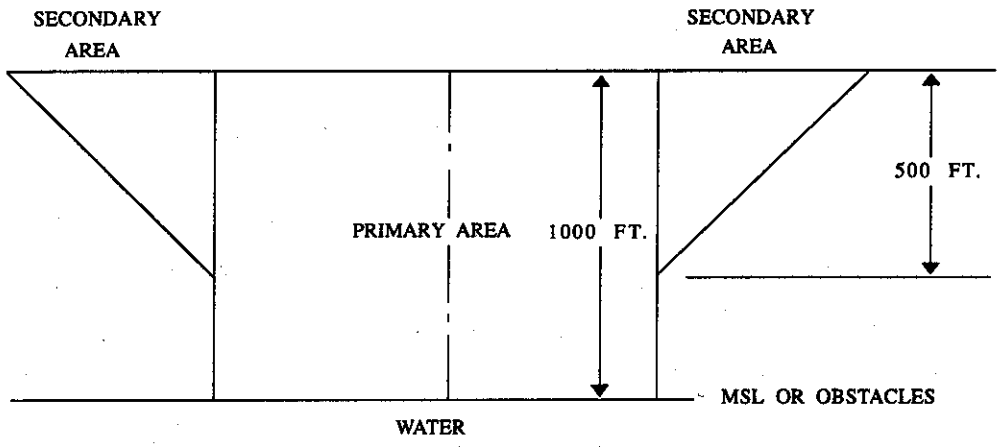
(a) The LAA will be increased to 700 feet as shown in Figure 9-5 with the radar altimeter inoperative.

(b) The LAA will be increased to 700 feet as shown in Figure 9-6 with the mapping radar inoperative.

(c) When the radar altimeter is inoperative, altitude will be adjusted upward 5 feet for each mile over 5 miles from the altimeter setting source to the descent altitude fix.

(2) Operations specifications for HEDA's are valid for 1 calendar year from the date of issue. Operators wishing to obtain HEDA revalidation must submit written confirmation to the CHDO that the HEDA is clear of obstructions and that positive course guidance is available. The operator must provide the means for any on-site inspections requested by the CHDO or FSDO.

FIGURE 9-1. EN ROUTE PROFILE



EN ROUTE PROFILE

FIGURE 9-2. EN ROUTE PLAN VIEW

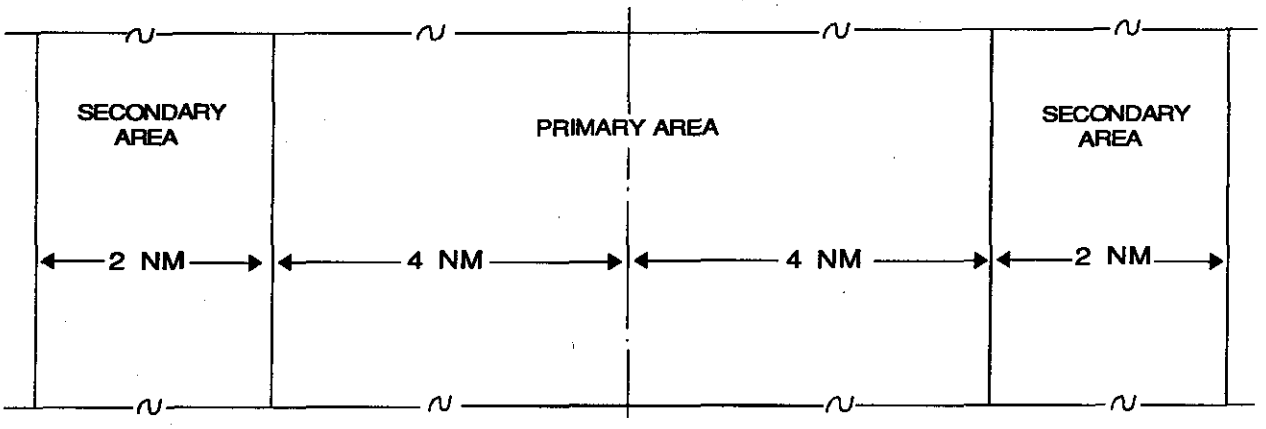
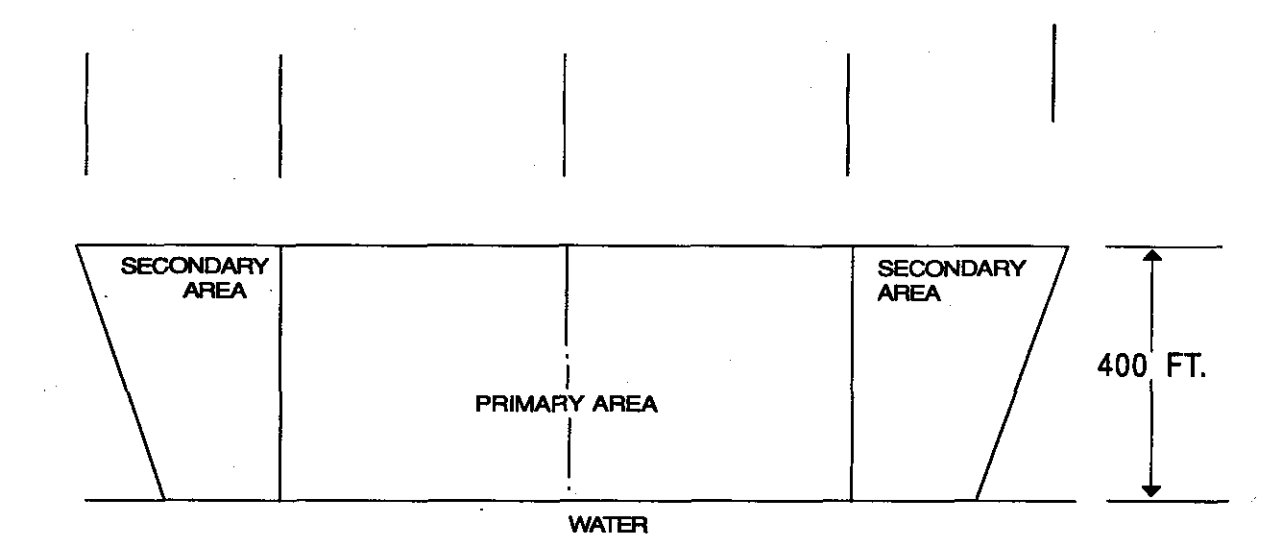


FIGURE 9-3. HEDA PROFILE



DESCENT AREA PROFILE

FIGURE 9-4. HEDA DIMENSIONS

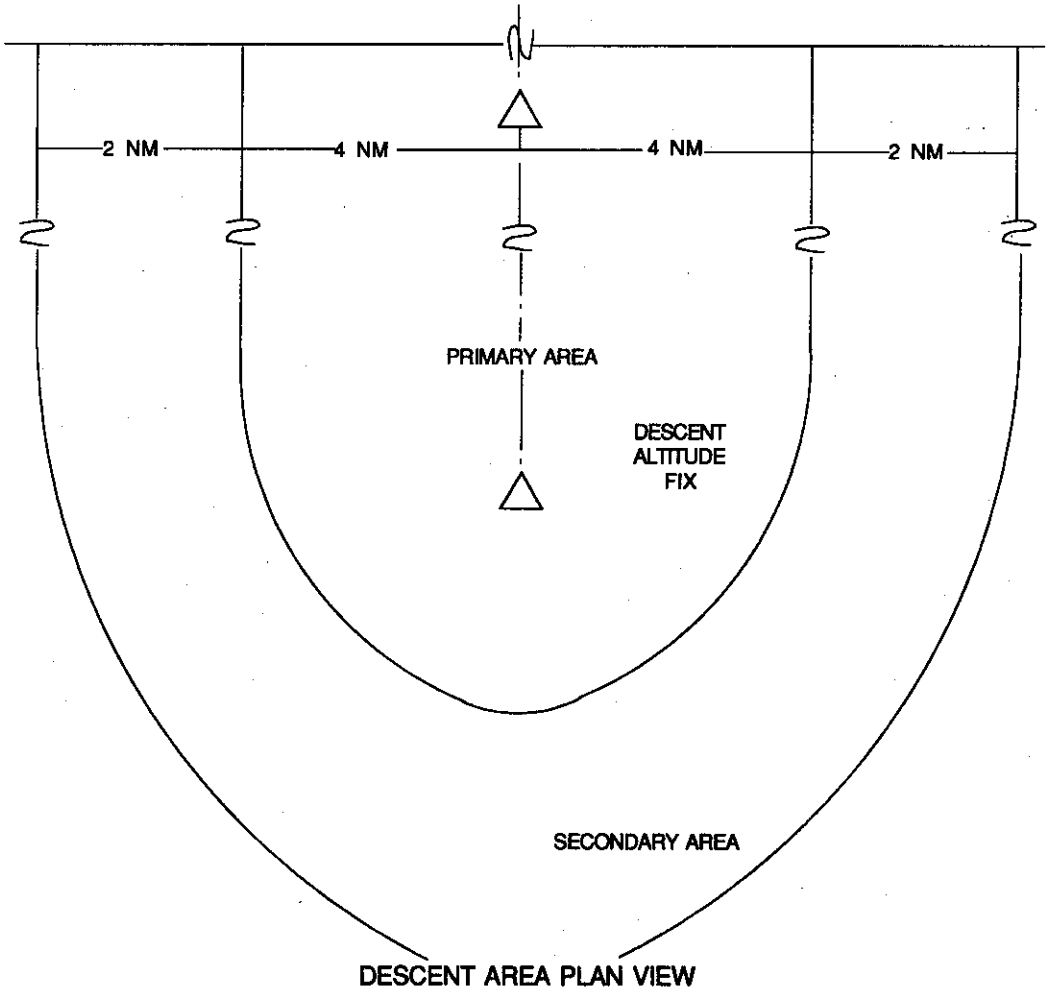
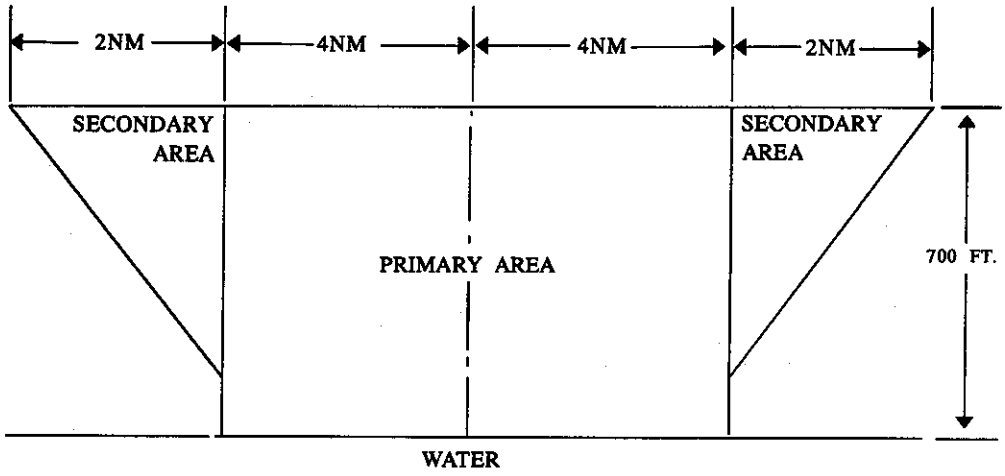
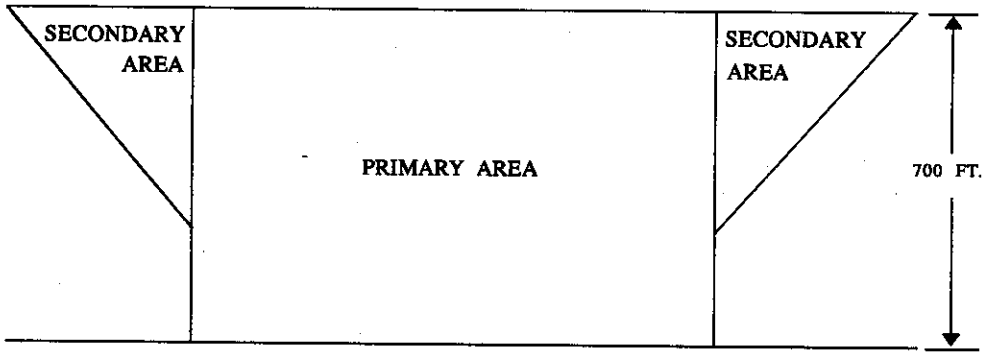


FIGURE 9-5. RADAR ALTIMETER INOPERATIVE



DESCENT AREA PROFILE

FIGURE 9-6. MAPPING RADAR INOPERATIVE



DESCENT AREA PROFILE

3. OFFSHORE INSTRUMENT APPROACH PROCEDURES.

a. General. These procedures are to be used by IFR-approved helicopter operators in an offshore environment to conduct instrument approaches to rigs, platforms, or ships that are at least 5 NM offshore in uncontrolled airspace. The helicopter will use the airborne radar approaches (ARA) or the offshore standard approach procedures (OSAP) for conducting instrument approaches in this environment.

b. Approach Approval Procedures. AC 90-80, "Approval of Airborne Radar Approach (ARA) Procedures for Helicopters to Offshore Platforms," contains approval guidance, procedures criteria, and a sample training program for offshore instrument approaches. ARA procedures are special instrument approach procedures approved under the provisions of FAA Order 8260.19, "Flight Procedures and Airspace," and FAA Order 8260.3.

(1) ARA Approval Procedures.

(a) The FSDO with geographic responsibility for the area in which the ARA will be conducted must verify the adequacy of obstacle clearances.

(b) Operators must demonstrate acceptable performance of en route and instrument approach procedures to the CHDO prior to the operator's obtaining approval to use these procedures.

(c) ARA's are documented on FAA Form 8260-7, "Special Instrument Approach Procedures."

(d) The FAA regional flight inspection and procedures (FIP) staff will inspect ARA's prior to approval by the CHDO. Minor changes of rig locations will be made in pen and ink, provided the en route egress point and procedures remain the same and the controlling obstacle does not change. Otherwise, the FIP staff will develop a new procedure.

(2) OSAP Approval Procedures.

(a) Operators that desire to conduct OSAP's must submit a written request to the CHDO according to the procedures stated in AC 90-80, as amended.

(b) The procedures contained in the request for approval will be evaluated and tested by the CHDO. Additionally, the operator's maintenance and training programs will be inspected prior to issuance of the authorization.

(c) Authorization for FAR Part 135 operators to conduct OSAP's will be made as part of the operations specifications.

(d) Authorization for FAR Part 91 operators to conduct OSAP's will be issued in an LOA (Figure 9-6)

FIGURE 9-7. SAMPLE LETTER OF AUTHORIZATION (LOA)

(Figure 9-7 is a sample LOA from AC 90-80, Appendix 5.)

January 20, 1993

Energy Resources, Inc.

1234 Fifth Avenue

Wellhead, LA 98765

Gentlemen:

Energy Resources, Inc. is authorized to conduct helicopter offshore standard approach procedures (OSAP) under Federal Aviation Regulations (FAR) Part 91 within the areas listed in this letter. Energy Resources, Inc. shall conduct all OSAP operations in compliance with the conditions, limitations, and procedures in this letter and shall conduct no other OSAP operations.

(a) Energy Resources, Inc. is authorized to use the following OSAP approach and landing minimums for the helicopters listed in the following table, provided that the conditions and limitations in paragraphs (b) and (e) are met.

HELICOPTER TYPE MAKE/ MODEL	MDA NOT LESS THAN	LOWEST VISIBILITY AUTHORIZED

(b) The flight instruments, radio navigation, and other airborne systems required by the applicable FAR must be installed and must be operational for OSAP operations. The airborne radar, Loran-C, and radar altimeter equipment listed in the following table is also required and, except for the radar altimeter, must be operational for OSAP operations.

HELICOPTER MAKE/MODEL/SERIES	ADDITIONAL EQUIPMENT

(c) Energy Resources, Inc. shall not conduct any OSAP operations unless an approved source of weather observations (including wave height) is located within 10 nautical miles of the approach target to which a particular OSAP is oriented, or extended operations are approved using enhanced weather information systems.

(d) No pilot or airborne radar operator shall conduct any OSAP operations in any helicopter unless that person has successfully completed the Energy Resources, Inc. training program and has been certified by an FAA inspector as qualified for OSAP operations.

(e) No pilot-in-command shall begin or continue the final approach segment of an OSAP unless all of the following conditions and limitations are met:

(1) the maximum indicated airspeed does not exceed 90 knots

(2) the maximum groundspeed does not exceed 70 knots (never slower than Vyse for multiengine helicopters) between the decision point altitude (DPA) and the missed approach point (MAP)

(3) there is no indication on the weather radar display of contouring due to the intensity of precipitation

(4) all obstructions that are observed on radar are avoided by at least 0.5 NM when below 900 feet MSL during a takeoff and departure procedure

(5) whenever a required radar altimeter is inoperative, the MDA must be increased by 5 feet for each NM in excess of 5 NM distance between the approach target and an approved altimeter setting source

(f) A missed approach shall be executed when any of the following conditions exist:

(1) any of the airborne equipment (other than a radar altimeter) required for the OSAP operations becomes inoperative

(2) at least 0.5 NM lateral separation from obstacles cannot be maintained after passing the DPA

(3) the approach target disappears from the radar display

(4) the reliability or accuracy of the Loran-C signal cannot be ascertained

(5) whenever the approach target is not in visual contact at any distance less than 0.7 NM

[Signed by the FSDO or CHDO office manager]

CHAPTER 10. CREW TRAINING FOR OCEANIC OPERATIONS

1. CREW QUALIFICATIONS.

a. Background. In the "International Standards and Recommended Practices - Annex 6, Operation of Aircraft," the International Civil Aviation Organization (ICAO) makes the following stipulations for flights outside the jurisdiction of member states:

(1) An operator shall ensure that all employees, when abroad, know that they must comply with the laws, regulations, and procedures of those states where operations are conducted.

(2) An operator shall ensure that all pilots are familiar with the laws, regulations, and procedures pertinent to the performance of their duties that are prescribed for the areas to be traversed, the airports to be used, and the related air navigation facilities. The operator shall ensure that other members of the flightcrew are familiar with such of these laws, regulations, and procedures that are pertinent to the performance of their respective duties in the operation of the aircraft.

(3) When the operation is conducted by the pilot-in-command (PIC), the PIC must perform the following:

(a) Comply with the relevant laws, regulations and procedures of the United States.

(b) Assume responsibility for the operation and safety of the aircraft and for the safety of all persons aboard during flight time.

(c) If an emergency situation that endangers the safety of the aircraft or persons necessitates action involving a violation of local regulations or procedures, the PIC shall notify the appropriate local authorities without delay. If required by the state in which the incident occurs, the PIC shall submit a report on any such violation to the appropriate authority of that state. In that event, the PIC shall also submit a copy in writing to the FAA Flight Standards National Field Office, AFS-500, P.O. Box 20034, Washington, DC 20041-2297. Such reports shall be submitted within 10 days of the incident.

(d) The PIC shall be responsible for notifying the nearest appropriate authority by the quickest available means of any accident involving the airplane resulting in serious injury or death of any person or substantial damage to the airplane or property.

b. Pilot as PIC. An operator shall not use a pilot as PIC of an aircraft on a route or route segment for which that pilot is not currently qualified until that pilot has demonstrated to the operator an adequate knowledge of the following:

(1) The route to be flown and the airports to be used

(2) The terrain and minimum safe altitudes

(3) The seasonal meteorological conditions

(4) The meteorological, communication, and air traffic facilities, services, and procedures

(5) The search and rescue procedures

(6) The navigational facilities and procedures, including any long-range navigation procedures associated with the planned route

The PIC must also demonstrate an adequate knowledge of procedures applicable to flight paths over heavily populated areas and areas of high air traffic density; obstructions; physical layout; lighting; approach aids and arrival, departure, holding and instrument approach procedures (IAP); and applicable operating minimums.

The PIC shall have made an actual approach into each airport of landing on the route, accompanied by a pilot who is qualified for that aircraft, as a member of the flightcrew or as an observer on the flight deck, unless:

(1) The approach to the airport is not over difficult terrain and the IAP's and aids available are similar to those which the pilot is familiar, and a margin to be approved by the Administrator is added to the normal operating minimums, or there is reasonable certainty that a specific approach can be made in visual meteorological conditions (VMC).

(2) The descent from the initial approach altitude can be made by day in VMC.

(3) The operator qualifies the PIC to land at the airport concerned by means of an adequate pictorial presentation.

(4) The airport concerned is adjacent to another airport at which the PIC is currently qualified to land.

2. TRAINING CONSIDERATIONS.

a. Crews conducting oceanic flights shall be trained in a manner approved by the Administrator. Approval of air carrier's training programs will be granted in conjunction with their certification and subsequent issuance of operations specifications. General aviation aircraft desiring to fly in special use airspace will be granted approval through the issuance of a Letter of Authorization (LOA) (See Chapter 3 of this AC.) Crew qualifications for the issuance of an LOA may be satisfied by one of the following:

(1) Completing an operator's oceanic operations training program

(2) Completing a commercial oceanic operations training program

(3) Submitting military training records indicating prior oceanic operations experience

(4) Using other methods indicating to the operator that the crew can safely conduct oceanic operations (Examples could include written testing, oral testing, or evidence of prior experience)

b. For a crew to be considered as being qualified for oceanic operations, crew members must be knowledgeable in the following subject areas:

(1) ICAO operational rules and regulations

(2) ICAO measurement standards

(3) Use of oceanic flight planning charts

(4) Sources and content of international flight publications

(5) Itinerary planning

(6) FAA international flight plan, ICAO flight plan, and flight log preparation

(7) Route planning within the special use airspace where flights are to be conducted

(8) En route and terminal procedures - different to U.S. procedures

(9) Long-range, air-to-ground communication procedures

(10) Structure of the special use airspace where the flights are to be conducted

(11) Air traffic clearances

(12) International meteorology, including significant weather charts, prognostic weather charts, tropopause prognostic charts, and terminal area forecasts (TAF)

(13) Specific en route navigation procedures for each type of navigation equipment required for use in the special use airspace

(14) Emergency procedures, including required emergency equipment, search and rescue techniques, navigation equipment failure techniques, and communication equipment failure techniques

CHAPTER 11. GENERAL AVIATION SHORT-RANGE AIRCRAFT OCEANIC OPERATIONS

1. INTRODUCTION.

This Chapter provides guidance to the general aviation pilot who is flying a light, general aviation aircraft in oceanic operations, and specifically addresses aircraft with a relatively short range that cannot transverse an ocean without intermediate fuel stops.

Many of the chapters in this advisory circular (AC) contain important information relative to oceanic operations. All pilots should scan each of these chapters and determine the pertinence of each chapter relative to the flight being planned. In addition, the information contained in this Chapter should be read in detail. It is important to note that this Chapter includes International Civil Aviation Organization (ICAO) rules and Canadian departure requirements for transoceanic flights. These requirements become regulatory to U.S. pilots by virtue of the content of FAR 91.703. Most short-range aircraft crossing the North Atlantic (NAT) will, out of necessity, make a Canadian departure. These aircraft are bound by Canadian regulations in addition to U.S. regulations and ICAO rules. Although emphasis in this Chapter is on NAT flights by short-range aircraft, the majority of the information is pertinent to all oceanic operations by short-range aircraft with the exception of operations in minimum navigation performance specifications (MNPS) airspace. MNPS operations are covered in detail in Chapter 3.

2. ICAO GUIDANCE.

A number of incidents have occurred with NAT international general aviation (IGA) flights that were caused by noncompliance with basic requirements for navigation and communication equipment needed for oceanic flights or flights over remote areas. Most of the incidents were potentially hazardous to the aircraft occupants and to aircrew members called upon to conduct the searches. Some of the incidents resulted in needless and expensive alert activities on the part of the air traffic control (ATC) communicators and controllers, and in search activities by rescue facilities. The incidents generally involved flights that were considerably off-course or had not made the required position reports. This Section provides information for flight planning and operation of IGA flights across the NAT, in particular those operations carried out by light aircraft. IGA pilots planning to cross the Atlantic at altitudes between flight level (FL) 275 and FL 400 (the altitude limits of MNPS airspace) must obtain a Letter of Authorization (LOA) for FAR Part 91 operations, or must receive operations specifications approval if conducting an air carrier operation. The approval processes are discussed in Chapter 3, Section 4 of this AC. Pilots planning to cross the Atlantic above MNPS airspace (FL 410 or higher) may wish to take advantage of the special climb-out provision detailed in Chapter 3, Section 2 of this AC.

a. The NAT Environment. The climate affecting NAT flight operations is demanding throughout the year, with storms or other adverse weather likely to be encountered during any season. It is probable that any transatlantic flight will encounter adverse weather on at least a portion of the flight. The scarcity of alternate airports available to transatlantic flights requires that all significant weather systems along the route be considered during the flight planning phase. Flights at higher NAT FL's (FL 275 - FL 400) are required to be equipped and authorized by the FAA for flights in the NAT MNPS airspace. Radio navigation systems available to pilots include Omega/very low frequency (VLF), Loran-C, and global positioning system (GPS). However, Loran-C coverage is incomplete in many areas, Omega equipped aircraft using E-field antennae are likely to suffer prolonged loss of signal reception when in or near a cloud covering, and a GPS system or sensor that meets the requirements specified in TSO-C129 may be approved as a means, but not the sole means, of oceanic navigation in NAT MNPS airspace. Therefore, it is extremely important that pilots understand the capabilities of their equipment and ensure that accurate navigation facilities exist to support their equipment throughout all of their proposed flight route. Several high power non-directional radio beacons (NDB) located in the NAT region are useful to automatic direction finder (ADF)-equipped aircraft. Some

of these stations, including commercial band transmitters, are not monitored for outages or interference by transmitters on adjacent frequencies and may be severely affected by atmospheric conditions without warning.

Very high frequency (VHF) communications coverage extends to line-of-sight distance from facilities in Canada, Iceland, Greenland, the Azores and coastal Europe. The Canadian VHF coverage is extended by use of a remote facility in southern Greenland. High frequency (HF) communications are available throughout the NAT region for ATC purposes. Use of HF by pilots on IGA flights permits proper monitoring of the flight's progress. HF-equipped flights should be able to receive HF meteorological information for aircraft in flight (VOLMET) broadcasts, including significant meteorological information (SIGMET) and continuous meteorological updates, at major terminals in Europe and North America. Search and rescue (SAR) vessels and aircraft are stationed at some locations in the NAT region, but SAR aircraft may not always be available. The availability of SAR vessels may depend on the disposition of a nation's civil emergency fleet. These fleets are often composed of a nation's fishing fleet, and their proximity may depend on the current fishing situation.

b. Pilot Qualification Requirements. The minimum pilot qualification for any flight across the NAT is a private pilot certificate. Unless operating below FL 60 (6000 feet mean sea level (MSL)), the pilot-in-command (PIC) must hold an instrument rating. The demanding NAT operational environment requires that the PIC have the following flight experience in addition to cross-country flight time:

(1) The PIC must meet the recency of experience requirements stipulated in FAR Part 91.

(2) The PIC must have adequate recent flight experience in the use of the long-range navigation and communication equipment to be used. It is highly recommended that pilots document training received and their experience using this equipment prior to embarking on any oceanic flights. This documentation will be invaluable should a navigation error report be filed due to equipment difficulties that cause an error.

c. National Regulations. Pilots of U.S.-registered aircraft must comply with all applicable U.S. regulations, ICAO Annex 2, and the regulations of the states in which they land or overfly. In cases when U.S. regulations are more stringent than ICAO rule or vice versa, pilots are bound to adhere to the more stringent regulation or rule.

d. Flight Rules Over the High Seas. ICAO member states have agreed that ICAO flight rules will be in effect for operations over the high seas. However, responsibility for enforcement of these rules rests with the state of registry of the aircraft or the state of registry of the operator. ICAO flight rules are contained in ICAO Annex 2. Procedural aspects are covered in ICAO Document 7030/3-NAT, "Supplementary Procedures Applicable in the NAT Region." Under FAR 91.703, U.S.-registered aircraft must comply with ICAO Annex 2. U.S.-registered aircraft planning to operate in MNPS airspace must also comply with FAR 91.705. Some of the more significant ICAO rules are paraphrased below:

(1) All flights that cross an international border must file a flight plan.

(2) All flights must file an instrument flight rules (IFR) flight plan when intending to fly in NAT airspace at FL 60 and above in New York, Gander, Shanwick, Santa Maria and Reykjavik Oceanic flight information regions (FIR); at FL 60 and above in the Bodo Oceanic FIR beyond 100 nautical miles (NM) seaward from the shoreline; and at FL 200 and above in the Sondrestrom FIR.

(3) While en route, all changes to IFR flight plans shall be reported as soon as practicable to the appropriate air traffic service (ATS) as prescribed.

(4) An arrival report must be sent to the appropriate ATS unit. When the flight plan cannot be closed by means of the aircraft radio, either a telephone or telegraphic message should be sent. Failure to close flight plans may result in a needless search operation.

*e. **Operation of Aircraft.*** ICAO member states have agreed that aircraft with their registration mark will comply with the standards concerning the operation of aircraft contained in ICAO Annex 6, as a minimum. Some of the more pertinent standards are paraphrased below:

(1) Before commencing the flight, the pilot must be satisfied that the aircraft is airworthy, duly registered, and that appropriate certificates are on board. Pilots flying U.S.-registered aircraft should be especially concerned with the "duly registered" aspects of this section. FAR 47.3 through 47.11 are specific regulations relative to the legality of U.S.-registered aircraft.

(2) Aircraft instruments and equipment must be appropriate for the operation, considering expected flight conditions. Chapter 2, Section 5 of this AC provides details of required instruments and equipment in addition to the information provided below.

(3) Meteorological information relevant to the flight must be obtained by the PIC and evaluated with regard to the planned route, destination, and alternative courses of action.

(4) Maps and charts that are current, suitable for the flight, and include alternative routes must be available on the aircraft.

(5) SAR information, including location of facilities and procedures to be used, should be obtained by the PIC.

(6) Notices to Airmen (NOTAM) should be checked by the PIC prior to departure to ascertain the status of radio navigational aids (navaids) and airport restrictions.

(7) Night operations can present additional problems that the PIC must consider, such as increased navigation difficulties, fatigue, more demanding pilot skills, and other factors.

(8) The PIC should check the Aeronautical Information Publication (AIP) of states where landings will be made or for states that will be overflown prior to departure. Various chapters in this

AC provide the necessary operational information derived from the AIP's, particularly with respect to the requirements for the carriage of survival equipment.

*f. **Equipment Requirements.*** Life rafts will be carried when single-engine aircraft operate more than 100 NM from shore, and when multiengine aircraft operate more than 200 NM from shore. These life rafts will contain at least the following:

(1) Pyrotechnic distress signals

(2) Food and water

(3) A VHF survival radio

*g. **Navigation Equipment.*** On transatlantic flights, aircraft shall be equipped with navigation equipment that will enable it to proceed in the following capacities:

(1) In accordance with the flight plan

(2) In accordance with the requirements of the ATS's

(3) In accordance with MNPS requirements when operating in that airspace (also see Chapter 3 for additional information relative to navigation equipment requirements in MNPS airspace)

*h. **Communication Equipment.*** In controlled airspace, flights must be able to conduct two-way radio communication on required frequencies. Use of emergency frequencies as a planned operation is in conflict with this rule. The VHF emergency frequency 121.5 megahertz (MHz) is not authorized for routine use. The frequency 131.800 MHz has been designated for use as the air-to-air communication channel in the NAT region. In the Gander, Shanwick, Santa Maria, Reykjavik, Sondrestrom and New York FIR's, HF

radios are required to contact ATS units when beyond the range of VHF. Subject to prior arrangement, VHF-only flights may be made via Canada/Greenland/Iceland/Europe, provided the Shanwick FIR is avoided. It is recommended that pilots planning these types of flights obtain and study the individual AIP's pertaining to their route of flight.

*i. **Special Requirements for Flights Transiting Greenland.*** The elevation of the highest point in Greenland is 13,120 feet MSL, and the general elevation of the icecap is 9,000 feet MSL. Due to the low temperatures and high wind speeds, the lowest useable FL under certain conditions may be FL 235 near the highest point, and FL 190 near the icecap. High-capacity cabin heating systems are needed due to the very low in-flight temperatures usually encountered, even in summer. Rapidly changing weather situations involving severe icing, severe turbulence, and heavy precipitation are common and require extra vigilance by pilots. The changes may be so rapid that they are difficult to forecast. An emergency locator transmitter (ELT) is required to transit Greenland due to the very difficult terrain that hampers searches. Regulatory compliance is monitored and states will be informed of any infractions.

Airport flight information is provided at Narssarssuaq Airport, Nuuk/Godthab Airport, Kulusuk Airport and Ilulissat/Jakobshavn Airport at Constable Point. The general locations of these airports are as follows:

- Narssarssuaq is on the southern tip of Greenland at the end of a fjord
- Nuuk/Godthab is on the west coast of Greenland halfway between Narssarssuaq and Sondrestrom
- Kulusuk is on the east coast of Greenland 343 NM northeast of Narssarssuaq
- Ilulissat/Jakobshavn is on the west coast of Greenland 137 NM north of Sondrestrom

Only flight information service and alerting service are provided within the Sondrestrom FIR below FL 195. IFR flights operating within the Sondrestrom FIR below FL 195 must have functional radio equipment capable of operating on the published HF's for Sondrestrom. Flights operating within the Sondrestrom FIR below FL 195 must have functional radio equipment capable of operating on the published HF's for Sondrestrom. Flights operating within the Sondrestrom FIR above FL 195 (i.e., Reykjavik or Gander control areas (CTA)), and outside of VHF coverage of Iceland or Gander, must have functional radio equipment capable of operating on the published HF's for Iceland/Gander.

*j. **Special Requirements for Flights Transiting Iceland.*** The general elevation of mountainous areas in Iceland is approximately 8000 feet MSL. Due to the great difference in pressure and high wind speeds, the lowest useable FL may, under certain conditions, be FL 120. An ELT with an energy supply independent of the aircraft shall be carried. The ELT must be capable of functioning continuously outside the aircraft for at least 48 hours, and of transmitting simultaneously on the frequencies 121.5 and 243 MHz. Aircraft should be equipped with sufficient and appropriate arctic survival equipment. Aircraft operating in the oceanic sector of the Reykjavik FIR must maintain a continuous watch on the appropriate frequency of Iceland Radio. When operations take place outside of VHF coverage of the air-ground station, carriage of an HF transceiver operational on appropriate frequencies is mandatory. However, prior approval may be obtained for flight outside VHF coverage and without HF equipment. Flights operating under this special approval are responsible for obtaining similar approval for operating in the airspace of adjacent ATC units. Flights between FL 80 and FL 195 on the route between Sondrestrom and Keflavik passing through 65N 30W and Kulusuk, and flights above FL 240 operating between the United Kingdom and Iceland that are routed at or north of 61N 10W, are considered adequately covered by VHF and are exempted from HF requirements. Navigation equipment adequate to navigate in accordance with the flight plan and in accordance with ATC clearances will be carried aboard the aircraft. Secondary surveillance radar (SSR) transponders with Mode 3/A and C are required in Iceland. Pilots shall operate SSR transponders continuously on Mode A, Code 2000, except that departing aircraft shall retain the last assigned code for 30 minutes after entry into NAT

oceanic airspace unless otherwise instructed by ATC. AIP's and NOTAM information are available on request at all Iceland airports of entry and from the following:

Directorate of Civil Aviation
Aeronautical Information Service
Reykjavik Airport, Iceland
101 Reykjavik

Telegraph address: CIVILAIR ICELAND
TELEX: 2250 FALCON ISLAND
AFTN: BICAYN

k. Special Requirements for Canadian Departures. Canadian Air Regulation S.540 prohibits single-engine aircraft from transoceanic flight departing Canada unless authorization is obtained from the Minister. This regulation also applies to multiengine aircraft that cannot maintain flight after failure of the critical engine. Authorization to commence a transatlantic flight from Canada must be obtained by the PIC of a single-engine or multiengine aircraft as described above after landing at Moncton, New Brunswick, Canada. When the Regional Director, Aviation Regulation (or a representative) is satisfied that requirements are met, the authorization will be granted. At least 48 hours prior to landing at Moncton, the pilot should inform the Regional Director, Aviation Regulation, 95 Foundry Street, Moncton, New Brunswick, Canada, EiC 8K6, Telex 0142 666, of the intended transatlantic flight, stating date and time of arrival at Moncton, aircraft type, registration mark, and pilots' and passengers' names and addresses. Inspections are also possible at other regional offices in Montreal, Toronto, Winnipeg, Edmonton, and Vancouver. However, it is requested that the first contact be made with Moncton to coordinate the details of an alternate inspection site.

(1) At Moncton or the alternate inspection site, the PIC shall satisfy an examining officer of the following:

(a) Certification as a pilot with a valid and current instrument rating

(b) Knowledge of the meteorological, communication, ATC, and SAR facilities and procedures on the route to be flown

(c) Knowledge of radio and other navaids, and ability to use these aids en route

(2) Authorized routes will be those that will provide a minimum of 3 hours fuel reserve at destination considering useable fuel, an appropriate flight manual fuel consumption and true airspeed (TAS) indication (documented or charted), and a ZERO wind component. The PIC must present a complete navigation log for the ocean crossing. The log must show 5 degree longitude checkpoints, tracks, variation, and distances with the capability to recalculate on the basis of the most recent forecast en route winds. In anticipation of equipment problems, pilots should make preparations to complete the flight using dead reckoning (DR) navigation techniques.

NOTE: Some experienced ferry pilots apply the forecast wind to each 5 degree longitude segment of track to the nearest 10 degrees, then add 10 knots if a headwind, or subtract 10 knots if a tailwind. Next they ensure that both wind direction and track are in magnetic units by applying variation to the true course. If the crosstrack wind component is over 20 knots, or the drift angle is over 10 degrees, they wait for a better wind before departing. High speed, unforecast winds can easily increase the flight time to the extent that a short range aircraft cannot comply with the 3 hour fuel reserve regulation.

(3) Upon arrival at the inspection site, the PIC shall present the following documents for inspection:

(a) Certificate of Registration from the state of registry. U.S.-registered aircraft are required to have a permanent registration. Temporary (pink slips) are not satisfactory for oceanic flights.

(b) Certificate of Airworthiness, Flight Permit, or Special Airworthiness Certificate.

(c) Certification and special conditions issued by the state of registry to allow over gross weight operations, if applicable.

(d) Certification issued by the state of registry for fuel tank modifications and/or the installation of temporary long-range tanks. For U.S.-registered aircraft, the certification requirements are satisfied by obtaining a completed FAA Form 337, "Major Repair and Alteration."

(e) Revised weight and balance records in the case of aircraft modified to carry extra fuel.

CAUTION: An export Certificate of Airworthiness does not constitute authority to operate an aircraft. It must be accompanied by one of the authorities listed in (b) above. These documents are not available at Moncton, and Canadian authorities have no authority to issue these documents to U.S.-registered aircraft.

(4) Aircraft are required to carry the following sea survival equipment:

(a) A readily accessible watertight immersion suit for each occupant, including undergarments which provide thermal protection

(b) A readily accessible lifejacket, complete with light, for each occupant

(c) A readily accessible Type W, water-activated, self-buoyant, water-resistant ELT

(d) A readily accessible life raft sufficient to accommodate all persons on board the aircraft. The life raft must be fitted with the following items:

(aa) Water, or a means of desalting or distilling saltwater, sufficient to provide at least one pint of water per person

(bb) A water bag

(cc) Water purification tablets

(dd) Food that:

- is in the form of carbohydrates
- has a caloric value of at least 500 calories per person
- is not subject to deterioration by heat or cold

(e) Flares (at least three per life raft)

(f) Hole plugs

(g) A bail bucket and sponge

(h) A signal mirror

(i) A whistle

(j) A knife

(k) A survival-at-sea manual

(l) Waterproof flashlights (minimum two per life raft)

(m) A first aid kit containing eye ointment, burn ointment, compresses, bandages, merthiolate, and seasick pills

(n) A dye marker

(5) The water and food may be stored and carried in appropriate containers separate from the rafts if the containers can be readily and quickly attached to the raft. In addition to the items listed as "sea survival equipment" (above), aircraft shall carry the following polar survival equipment for flights over Labrador, and for any flight routing north of Prins Christian Sund over Greenland:

(a) A signalling sheet (minimum 1 x 1 meters = 3.28 feet by 3.28 feet) in a reflecting color

(b) A magnetic compass

(c) Winter sleeping bags in sufficient quantity to accommodate all persons carried

(d) Matches in waterproof covers

(e) A ball of string

(f) A stove and supply of fuel or a self-contained means of providing heat for cooking and the accompanying messkits

(g) A snow saw

(h) Candles or some other self-contained means of providing heat with a burning time of about 2 hours per person. The minimum candles to be carried shall not be less than 40 hours of burning time

(i) Personal clothing suitable for the climatic conditions along the route to be overflown

(j) A suitable instruction manual in polar survival techniques

(k) Mosquito netting and insect repellant

(6) Aircraft must be equipped with the following instruments and equipment in serviceable condition:

(a) An airspeed indicator and heated pitot head

(b) A sensitive pressure altimeter

(c) A direct reading magnetic compass that has been swung within the preceding 30 days with the aircraft in the same configuration as for the intended transoceanic flight

(d) A gyroscopic direction indicator or a gyromagnetic compass

(e) A turn and bank indicator

(f) A rate of climb and descent indicator

(g) An outside air temperature gauge

(h) A gyroscopic bank and pitch indicator

(i) Unless another timepiece with a sweep-second hand is available, a reliable, installed timepiece with a sweep-second hand

(j) If there is a probability of encountering icing conditions along the route to be flown, deicing or anti-icing equipment for the engine, propeller, and airframe

(k) If any portion of the flight is to be made at night, the following must be included:

- Navigation lights
- Two landing lights or a single landing light having two separately energized filaments
- Illumination for all instruments that are essential for the safe operation of the aircraft
- An electric flashlight at each required flight crewmember's station

NOTE: All equipment and cargo carried in the cabin shall be secured to prevent shifting in flight and placed in such a position so as to not block or restrict the aircraft's exits.

NOTE: Portable oxygen equipment is recommended. This equipment is useful when trying to avoid icing and/or for the additional altitude required over the Greenland icecap.

(7) In the oceanic control areas (OCA) and FIR's, VHF coverage is not sufficient to ensure continuous two-way communications with ground stations. Although relay through other aircraft is sometimes possible, it is not guaranteed. As mentioned elsewhere in this AC, emergency frequencies are not to be used for planned position relays or any other purposes except for bona fide emergencies. HF radio is mandatory for each aircraft crossing the Atlantic. The only exception is for aircraft flying at FL 250 or above crossing Greenland. Route-specific navigation equipment requirements for navigation in accordance with the flight plan and any ATC clearances are listed below:

(a) Iqualuit [Frobisher Bay] (CFYB) to Greenland: Two independent ADF receivers with BFO/CW capability. Portable ADF's are no longer acceptable.

(b) Goose Bay, Labrador to Narssarssuaq, Greenland: Two independent ADF receivers with BFO/CW capability.

(c) Goose Bay to Reykjavik, Iceland via Prins Christian Sund, Greenland: Two independent ADF receivers as above, or one ADF set and one Loran-C set. Danish CAA strongly recommends two ADF sets because of poor Loran-C reception around Greenland.

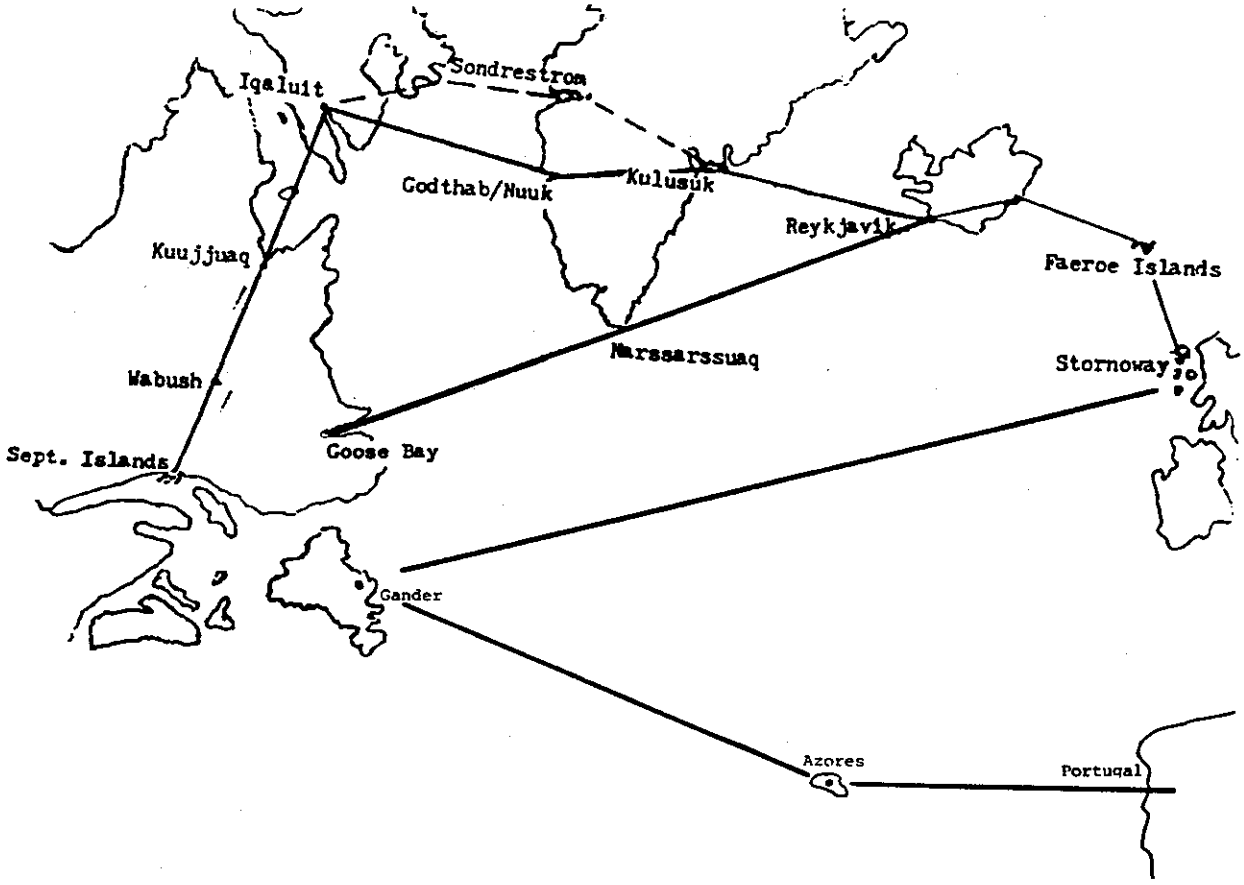
(d) Gander, Newfoundland to Shannon, Ireland: One Loran-C set and one ADF set.

(e) St John's, New Brunswick to Santa Maria (Azores): One Loran-C set and one ADF set. Note that Loran-C reception ends short of the Azores.

NOTE: Extended range mode or X-range will not provide reliable Loran-C reception in Labrador and Greenland, in spite of manufacturer's claims. Appendix 2 depicts the coverage of Loran-C chains. It should be noted that short-range aircraft routes across the NAT are at best only on the fringes of Loran-C coverage if within coverage at all.

(8) Each aircraft shall carry current aeronautical maps, charts, airport data, and IFR Approach Plates covering the area over which the aircraft might be flown and for airports along the route of flight. This includes en route and potential departure diversions as well as destination alternates. Although a flight is planned as a VFR flight, the Canadian government insists that pilots carry IFR publications due to the ubiquitous potential for instrument meteorological conditions (IMC) in the NAT region. Aircraft intending to land or anticipating a possible diversion to Narssarssuaq, Greenland shall carry either the BGBW Visual Approach Chart depicting the fjord approach, or a topographical chart of large enough scale to permit map reading up the fjord. Pilots must have charts in the aircraft at the time of inspection in Moncton. Charts are not for sale at Moncton or at any of the coastal airports in the vicinity of Moncton. It is advisable for pilots who do not have an available source of publication to contact one of the commercial publishers of "Trip Kits" to obtain the necessary publications. Flights should be planned using current aeronautical charts and the latest Class I and Class II NOTAM's. It is extremely important that the PIC be familiar with the nature of the terrain over which the flight is to be conducted. If unfamiliar with the terrain, the PIC should consult with officials at the appropriate local aviation field offices before departure. These officials, as well as local pilots and operators, can provide a great deal of useful advice, especially on the ever-changing supply situation at remote locations such as Frobisher Bay, the location and condition of possible emergency landing strips, potential hazards, and en route weather conditions. During preflight planning, the PIC must ensure that required fuel, food, accommodations, and services are available at intermediate stops and at the destination airport.

FIGURE 11-1. FOUR MAJOR ROUTES USED BY SHORT-RANGE AIRCRAFT CROSSING THE NAT



(9) The four major routes used by short-range aircraft to cross the NAT are depicted in Figure 11-1 above. All except the northern route require the installation of long-range fuel tanks to satisfy the 3 hour reserve fuel requirement. In addition, each of these routes presents its own peculiar set of problems.

(a) The northern route is the longest route, but has the shortest overwater legs. It does, however, transverse long distances over remote, hostile, unpopulated terrain. This route for relatively short-range aircraft normally follows a route that heads almost due north from Moncton to Sept-Isle to Shefferville to Kuujjuaq to Iqualuit (formerly known as Frobisher). At Iqualuit, the flight heads eastbound overwater to Greenland. Pilot reports from Kuujjuaq indicate that there are times when fuel is not available at Kuujjuaq, and that quarters are primitive (if available at all). Once reaching Greenland, the route traverses the icecap, which can mean flying at FL 130 or higher. This presents the potential for cold temperature, icing, and severe weather. Pilots should expect no Loran-C reception; good ADF tracking is essential.

(b) The direct route from Goose Bay, Labrador (CYRR) to Reykjavik, Iceland via Prins Christian Sund, Greenland NDB is one of the best routes with Narssarssuaq a midway alternate, although the NAT storm track can cause problems with wind and weather. This route means potential icing and weather problems over the Davis Straight (between Greenland and Iceland), plus coping with a demanding day-only VFR approach. Loran-C is unreliable at both ends of this approach, and there is steeply rising terrain on both sides and at the end of the approach.

(c) Gander, Newfoundland direct to Shannon, Ireland presents the usual problems of NAT severe weather, plus the significant effect that an unforecast wind shift can have on a slow aircraft flying a 1700 NM leg. In addition, the amount of extra fuel that would be used with even a 5 knot unanticipated headwind would be significant over such a long range. The one positive factor that favors this route is that Loran-C coverage is continuous throughout the route.

(d) The route from St. John's, New Brunswick in Canada to Santa Maria in the Azores has the advantages of generally better weather and higher temperatures. The airport at Flores, located 300 NM west of Santa Maria, is a good alternate. The disadvantages are that Loran-C coverage is not reliable for the whole distance, and an unforecast or unsuspected wind shift coupled with poor ADF equipment and/or procedures could mean missing the Azores altogether.

l. Additional Notes. Since icing is a severe hazard for light aircraft, temperatures should play a significant part in flight planning. June to September is the best time of year for all of the routes. At other times, the St. John's to Santa Maria route is the best choice because it overflies the Gulf Stream. An analysis of the most favored routes by professional ferry companies indicates that the route from Goose Bay direct to Reykjavik is the most popular, with the Santa Maria route being the next in popularity. However, it must be emphasized that most light aircraft need to have long-range tanks installed to traverse these routes.

m. Flight Plans. Flight plans for international flights originating in Canada, flights in Europe, and flights entering Canada from overseas must be filed in the ICAO format. A sample ICAO flight plan is located in Appendix 1 of this AC. IFR (ICAO) flight plans are mandatory at or above FL 60 (6000 feet MSL) in all oceanic CTA's, the Reykjavik FIR, and at or above FL 195 in the Sondrestrom FIR (Greenland and off the coast of Greenland). Although VFR flight under the OCA (5500 MSL and below) is possible, there is little advantage in flying VFR. In fact, the Canadian government predicates their requirements upon the assumption that IFR will be encountered at some time during the flight. Therefore, it is prudent to take advantage of the flexibility, winds, safety factor, and navigation/communication radio reception of the higher altitudes afforded by an IFR flight.

n. Additional Canadian Inspection Notes. Transport Canada will no longer approve for transatlantic flight an aircraft fitted with a "placarded" ferry tank where it is obvious that the intent of the placarding is to avoid regulatory inspection of the installation, and issue of a Special Airworthiness Certificate for over-gross operation. A permanent waiver of the Canadian transoceanic inspection is available providing a pilot has successfully completed at least two inspections and transoceanic flights. However, a waivered pilot is still subject to spot checks by any NAT ICAO Provider State.

o. Canadian Customs Procedures. Pilots must land at a Canadian Customs authorized airport of entry (AOE), and a flight plan must be filed for all transborder operations. It should also be noted that VFR at night is not allowed, nor is VFR-on-top allowed in Canada. Canadian customs must receive notification in sufficient time to enable designated customs officers to inspect the aircraft.

3. OTHER CONSIDERATIONS.

a. Personal Physical Needs. These include nourishment, body comfort, and provisions for biological relief. Certain foodstuffs are required for Canadian departures, but all pilots should familiarize themselves of the caloric content, sugar content, ease of access, digestibility and weight of the food that they intend to use during flight. Foods should be high in calories but low in sugar content. Sweets will provide the body with an immediate energy lift but will dissipate in effectiveness very rapidly and will have a tendency to create thirst. Biological relief is an extremely important factor to consider. A pilot who has overextended his/her human range (HR) can be distracted by pain to the point where intelligent decision making and physical skills will deteriorate to the point of creating a serious safety hazard. Pilots can increase HR by eating and drinking prudently prior to each leg of the flight. Another consideration is that of body comfort. Although watertight immersion suits are required for flights departing Canada, this is only one form of protective clothing that should be considered. The potential need to climb to a high altitude to escape detrimental

winds or to fly over the icecap in Greenland demands that the pilot has warm clothing readily available and easily accessible. Glare is also a significant hazard when flying above the clouds or flying over an icecap which indicates that a pair of good sunglasses are an important consideration. Noise creates a fatigue factor and should be reduced as much as possible. If not intending to use a head set for the complete flight, pilots should have a set of ear plugs available. The last consideration is extremely important if flights above 10,000 feet are anticipated (as part of the planned flight or as a possible contingency). This consideration is for oxygen requirements. No matter what a pilot's health status happens to be, prolonged flights above 10,000 feet without oxygen are an invitation to disaster.

b. The Aircraft. Fuel burn and the range of an aircraft are important considerations in the preflight planning stage of any trip, whether, international or domestic, and most pilots will take great care in ensuring that there is adequate fuel for a flight. One consideration, however, that is not quite so evident is oil usage. Domestically, one can make an emergency landing if some indication of excessive oil usage presents itself. On an oceanic flight, the preflight oil level is the maximum oil available for a trip leg unless some ingenious invention is devised to measure oil levels and to replenish the oil in-flight. Because this situation is nearly impossible (early pilots were known to climb out on struts, etc., and replenish oil), it is advisable to make oceanic crossings only with aircraft that have engines which have not exceeded their half-life.

c. Equipment. Various equipment requirements including navigation and communication equipment are discussed in above sections of this Chapter. It is important, however, to make another equipment check: the condition of the magnetic compass, its accuracy, and the extreme variations that can be encountered in various sections of the world. Pilots should also review those turning errors that may have been forgotten since their last check ride.

d. Charts. When making a transoceanic flight, no one type of chart is totally adequate. It is important that the characteristics of various types of charts be known and carried. Some of these characteristics are itemized below.

(1) Jeppesen Plotting Charts. These charts have magnetic variation information, but the NAT charts have no radio navigation or topographic information although the Pacific charts do have the radio navigation frequencies. These charts do have up-to-date OCA boundaries, FIR, air defense identification zone (ADIZ), distant early warning identification zone (DEWIZ), and their required reporting points. The scale of these charts is 1:10,000,000, and their size make them convenient for cockpit use.

(2) Defense Mapping Agency's Global Navigation Chart (GNC). These charts indicate variation, topography, ADIZ, and the location of VHF omnidirectional radio ranges (VOR) and NDB's. They do not have the FIR boundaries shown or the navigation frequencies listed.

(3) Global Loran-C Charts (GLCC). These charts only contain Loran-C information for navigation and isogonic lines. They do not depict topography, and the OCA information is not necessarily up-to-date.

(4) National Oceanic and Atmospheric Administration (NOAA) Route Charts. These charts are primarily designed for planners and controllers. Although not particularly useful to pilots, the charts do depict latitude and longitude information and the frequencies of some VOR's and NDB's. These charts are particularly useful to pilots planning their first transoceanic flight because they cover a large geographical area and provide an excellent overview of the area to be overflown.

(5) Operational Navigation Charts (ONC). These charts are similar to the U.S. World Aeronautical Charts (WAC) and detail topographical features. They are extremely important to a pilot planning routes which have long legs over land masses (such as the route from Moncton to Frobisher).

(6) Approach Plates (Jeppesen or NOAA). On trips of the length required for a transoceanic crossing, the potential for having to make an IFR approach is a real possibility. These plates become a real necessity when one is forced to make an unscheduled landing at an airport with a hazardous NDB approach such as Narssarssuaq, Greenland. It would be nearly impossible, even in an emergency, to try

and make an approach to this airport without any guidance. In fact, a note appears on the Jeppesen version of this approach which states, "Caution: Pilots w/o a good knowledge of the local topographical and met conditions are advised not to make any attempt to approach through the fjords, unless ceiling at least 4000" and visibility 800 m." (2624.67 feet or approximately 1/2 mile). Approach plates should not only be carried for airports of intended landing and alternate airports, but also for every airport along the intended route of flight. Flight information publication (FLIP) charts may be preferred by some pilots, but a word of caution is needed regarding these charts: they do not depict every airport for which an instrument approach is available.

e. Weather. Although pilots are required to have a knowledge of weather, weather charts, and the procedures for accessing weather information, in the United States weather information is readily accessible and easy to decipher. On transoceanic flights weather information is often outdated, difficult to obtain, and is in a format unique to the geographical area in which it is disseminated. Pilots must hone those long-forgotten skills of interpreting charts and making their own prognosis of pending weather. They must also be aware of all of the available sources of weather along the route of their flight. Terminal area forecasts (TAFORS) are similar to the U.S. terminal forecasts, and they are referred to as airport forecasts (TAF). A complete listing of TAF codes is included in Appendix 1 of this AC. It is important that pilots have a knowledge of these codes, and are able to interpret them and apply their meanings to an actual flight situation.

FIGURE 11-2. GENERAL SAFETY NOTES

1. Know your aircraft. Pull cowling and inspect for leaks and check the general condition of the aircraft. The following aircraft components must be reviewed:

- Fuel system and management
- Radio equipment and condition
- Engine condition
- Oil consumption
- Oil pressure
- Oil temperature
- Instruments

2. Check compass on nearest runway heading to your course (use a compass rose if one is available):

- Swing compass with radios and navigation lights **ON**
- Check compass deviation with master switch **OFF**
- Check compass deviation with VHF **OFF**
- Check compass deviation with HF **ON** and then **OFF**
- Check compass deviation with pitot heat **ON**
- Check compass deviation with rotating beacon **ON** and then **OFF**
- Log results of the above deviations
- Keep alternator load at or below 50 percent during compass testing, if possible
- **DO NOT** assume that the compass card is accurate

3. ADF may be affected by the alternator, the VHF, the HF, the pitot heat, the rotating beacon, the autopilot, costal refraction, and atmospheric conditions. Check and recheck all navigation equipment under all operating conditions.

4. En route freezing levels should be 3000 feet AGL or higher to allow room for ridding aircraft of ice. If a departure must be made in below freezing temperature, it is imperative that the flight is in VFR conditions and clear of clouds until an area with higher freezing levels is reached.

5. Significant icing has been encountered at Goose Bay, Narssarssuaq, and Reykjavik as late in the year as early June.

6. The departure alternate should be VFR.

7. Destination weather should be well above IFR minimums and forecast to remain above minimum or improving. It is important to remember that after long flights at altitude, a pilot's capability to handle marginal weather will be in serious doubt. Personal weather minimums should be much higher than published minimums. An alternate airport should be selected with the same minimums criteria.

8. Do not deviate from the flight plan unless the aircraft's position can be positively identified without navigation equipment. This prevents serious consequences in the event of radio failure.

9. Make all position reports when required, and report any problems to ATC as soon as possible. When reporting, it is prudent to provide ATC with a fuel remaining report in hours and minutes. Although not required, this information can be invaluable to ATC in the event of an emergency.

10. If in trouble, report the situation to ATC immediately by HF or VHF on 121.5 MHz and request assistance. Do not wait to report. It might take SAR an extended period of time to reach a troubled aircraft's position. The aircraft should not deviate from its flight plan unless Air/Sea Rescue advises the use of a new heading. If unable to make contact by radio, the ELT should be manually activated.

FIGURE 11-2. GENERAL SAFETY NOTES - Continued

11. Air carrier traffic over the Atlantic is heavy. Do not hesitate to enlist the assistance of these aircraft in relaying a position fix, obtaining weather updates, or reporting an emergency. Air carriers are quite willing to assist anyone having difficulties and often their FL is high enough to relay communications. However, emergency frequencies should only be used for actual emergencies. It is acceptable to utilize emergency frequencies to make an initial contact, but only to request that someone communicate with the caller on another frequency.

12. Fatigue is a "sneaky" killer. A pilot often does not realize that he/she was fatigued until after an accident has taken place. Realistic work loads should be determined prior to commencing a flight and should not be exceeded unless an extreme emergency requires one to do so. The following situation is one in which it is very evident that fatigue contributed to a dual fatality.

> A ferry pilot and his passenger departed Goose Bay in a Bonanza early one morning. They refueled in Reykjavik, then flew on to Scotland. The aircraft crashed 2 miles short of the runway at Glasgow, Scotland during a standard ILS approach. No severe weather existed and no aircraft problems were reported. Investigation revealed that all systems had been operating correctly and that the engine was running at the time of the crash. A synopsis of all factors involved indicated that pilot fatigue was the course of this accident.

No person shall fly an aircraft, nor should an operator require a person to fly an aircraft, when the person is suffering from fatigue or will encounter a workload that will induce fatigue.

13. Pilot reports (PIREPS) are significantly more important in remote areas and in oceanic areas of operation. The absence of weather reporting stations demands that pilots experiencing weather conditions that are likely to affect the safety of other aircraft or other hazardous flight conditions, report these to ATC as soon as possible.

CHAPTER 12. POLAR FLIGHTS

Like most other North Atlantic (NAT) traffic flows, traffic on the Europe-Alaska axis is predominantly unidirectional; in the Reykjavik control area (CTA) the westbound peak is between 1200 - 1800 coordinated universal time (UTC), and the eastbound peak is between 0001 - 0600 UTC. To facilitate the flow of this traffic during the peak period and to avoid a multiplicity of random routes, a polar track structure (PTS) consisting of 10 fixed tracks has been established (see Appendix 2). Although not mandatory, flights planning to operate on the Europe-Alaska axis at flight level (FL) 310 - 390 inclusive during peak periods are strongly recommended to submit flight plans in accordance with one of the promulgated PTS tracks.

Even though equipment has improved greatly since Admiral Byrd's day, the inherent hazardous conditions still exist. Admiral Byrd in his book, "First to the North Pole," which has been excerpted in "Men in the Air," Crown Publishers, Inc., New York. Copyright 1990 by Brandt Aymar, significantly detailed the extreme hazards of operating in this hostile environments. These are some of the points that he made:

1. The utmost attention to detail to flight planning.
2. The importance of survival equipment, including food supplies if a long trek over the ice cap became an eventuality.
3. A means for obtaining food supplies from nature, e.g. rifle, an ice axe and fishing gear.
4. The lack of reliability of the magnetic compass, which in polar regions can point more than a thousand miles south of the North Geographic Pole.
5. The lack of accuracy of the gyroscopic compass, which when nearing the Pole, would have a tendency to point straight up in the air.
6. The severity of wind conditions and its effect on navigation.

It is evident from the above that flight in the far north is difficult. These trips require detailed planning, an abundance of equipment, extensive knowledge, and some luck in not experiencing any undue circumstances such as un-forecast weather, navigation and/or communication failure, engine problems, or airframe problems. Byrd's thoughts are included in this advisory circular (AC) as "food for thought." In spite of the advances in aircraft and navigation/communication equipment, the harsh realities of flight in the far north are ever present. Loss or failure of any equipment reduces the flight to one that relies on the basic and emergency equipment that is carried and the extent of knowledge which the crew has in its use.

The rapidly changing world of Global Positioning System (GPS) navigation is making this an attractive system for use in making trans polar flights. However, caution should be exercised when using GPS. On Thursday February 3, 1994, Transport Canada made a presentation as a part of an FAA GPS Seminar and stated that GPS is being advocated in Canada as much as it is in the United States because of its potential use as an economic navigation system in many of the remote areas served by Canadian operations. They further stated that although GPS can make a significant economical impact on operations in Canada, that their research in the vicinity of Resolute Bay (N74°44.8′ W94°59.7′) indicates a lack of integrity with stand-alone GPS navigation systems. It is therefore recommended that operators intending to utilize GPS as a principal source of navigation in the polar regions, contact transport Canada regarding the latest status of their integrity studies.

CHAPTER 13. OCEANIC OPERATIONS TO THE FORMER SOVIET UNION AND OTHER SOVIET BLOC NATIONS

1. INTRODUCTION. The geopolitical area formerly known as the Soviet Union is now comprised of numerous independent states (IS). This section of the world is undergoing rapid and often unanticipated changes in the field of international and domestic aviation. As updated information becomes available, it will be included in future revisions of this advisory circular (AC).

2. GENERAL. As a result of the new bilateral air transportation agreement between the United States and some of the IS, a significant increase in air transportation between the two countries is expected. Operators of both large and small aircraft will be increasing scheduled and chartered air service. Due to the short distance between the state of Alaska and Russia, significant increases in air traffic are expected in the far eastern portion of this region. This area has traditionally been called the Soviet Far East (SFE).

a. Overview of Regional Differences in the IS. The area comprising the IS is more than twice the size of the United States and is significantly more diverse in terms of aviation infrastructure. Flight operations within the western part of the country (generally west of the Ural mountains) are considerably less challenging than flights within the eastern part of the area. In the east, primarily due to limited facilities, sparse population, and harsh winter weather, routine flight planning can be quite challenging. Communications, navigation, and airport availability require special emphasis when planning flights within this region. Although operating aircraft in the western IS is generally less demanding, many significant operational differences exist. The airports and airways in the IS are divided into two categories: international and domestic.

b. International Airports and Airways. International routes and airports in the IS are generally available for use by foreign aircraft operators, provided the operators have received appropriate flight authorizations. These routes and airports are published in the appropriate Aeronautical Information Publication (AIP). Many of the newly formed countries are currently publishing AIP's and these should be obtained prior to operating in or over any country that was formerly part of the Soviet Bloc. Air traffic control (ATC) communications are provided in English, and airports have customs and immigration services as well as fuel (AVGAS availability is limited). Instrument approach procedures (IAP) are generally available in the International Civil Aviation Organization (ICAO) format and are similar to approach procedures used worldwide.

c. Domestic Airports and Airways. Domestic airports and routes in the IS are generally not usable by foreign aircraft operators unless a local navigator is used to communicate with ATC and to provide instructions to the flightcrew regarding navigation principles and procedures. En route and terminal ATC within the domestic systems are accomplished using Russian, since a large percentage of IS air traffic controllers do not speak English. En route charts and IAP's for the domestic system are not published in English, are generally not available to foreign aircraft operators, and may not meet ICAO requirements. Weather and Notice to Airmen (NOTAM) information is difficult or impossible to obtain, and is not provided in English or in standard format.

d. General Navigational Considerations. Navigation off established airways in the IS is generally not permitted. Foreign aircraft operations are restricted to published international routes and airports, even for refueling stops and alternate airports. Appropriate flight crewmember training on metric conversion and the in-flight availability of conversion charts are necessary to enable crewmembers to convert metric altitudes, weights, and windspeeds. Although operators are technically permitted to conduct flights to or within the IS under visual flight rules (VFR), there are significant IS flight rules differences that normally preclude foreign aircraft operators from conducting flights under VFR. In some areas, ATC procedures have been developed to allow operations off published routings using radar vectors. If clearance is received to operate off airways, the carrier is authorized to accept the clearance. However, due to military concerns, it is possible that the radar vectors received may not be the most expeditious for the carrier.

e. AIP. The U.S.S.R. AIP is the primary document available (at the time of publication of this advisory circular) concerning foreign aircraft operations within most of the IS, but this is rapidly changing and many states are now or will soon be publishing their own AIP's. Because of the rapid change, operators should exercise extreme care in determining the status of the AIP to be used. The U.S.S.R. AIP is published by the Aeronautical Information Service (AIS), which is part of the Ministry of Civil Aviation (MCA) of Russia. It is published in both Russian and English and contains detailed flight operational requirements as well as terminal, airport, and instrument approach charts in ICAO format. It is available from the AIS on an annual subscription basis, including monthly revisions. The navigation charts and standard instrument approach procedures (SIAP) for Russia and other IS's domestic systems are not included in the AIP and are usually not available in English. Further information may be obtained from the following:

The Russian Embassy
1125 16th Street, N.W.
Washington, DC 20035
Telephone (202) 628-7751

f. ATC Communications. The ATC communication system within the IS is generally good. Very high frequency (VHF) is commonly used for en route communications, but high frequency (HF) is required for certain routes. Communication equipment requirements are listed in the U.S.S.R. AIP. However, Russian and other IS air traffic controllers have limited access to weather and NOTAM information.

g. Aeronautical Fixed Telecommunications Network (AFTN) or Society Internationale de Telecommunications Aeronautique (SITA) Networks. Data transmission and reception in the IS is accomplished using the AFTN or SITA networks, although in remote areas only AFTN may be available. Transmitting or receiving messages using the AFTN system within the IS to and from many remote areas, especially in the SFE, may be less timely than desirable. Most messages enter and depart the IS in Moscow, and the manual manipulation of messages is required at many transfer stations before and after reaching Moscow. For example, an AFTN message from Anchorage, Alaska to Magadan, Russia, will be transmitted via Moscow, and then to several switching stations between there and Magadan. At the switching stations, messages must be hand-carried from the receiving area to the transmitting machine.

h. Telephone Service. Telephone service to, from, and within the IS is limited. A variety of systems are used, including an HF troposcatter system which, due to technical limitations, makes communication extremely difficult. Establishing reliable communications to and from line stations within the IS may be more challenging than in other areas.

i. Navigation. Navigation on international routes within the IS is permitted using Class I or Class II navigation systems. Route widths vary from 8 km to 20 km, as indicated in the U.S.S.R. AIP. It is the pilot's responsibility to keep the aircraft within established airway boundaries. Available altitudes also vary from one route to another as identified in the U.S.S.R. AIP. When planning flights, operators must ensure that the desired and required altitudes are available for particular routes. This is especially important in the SFE, where there is usually only one route available for flights. As an example, from the Anadyr nondirectional beacon (NDB) along A-81 on the eastern coast of Russia to the Troitskoye NDB there is no parallel airway for a distance of over 1600 miles. Deviation from this route due to weather requirements may be impossible to obtain. In the SFE, Class I en route navigation on international routes is primarily accomplished using NDB's; however, numerous compatible VHF omnidirectional radio range (VOR) transmitters will be installed in the coming years. In western Russia, compatible VOR transmitters are also used to define international routes. In certain situations, especially in the SFE, it may be necessary to require operators to use Class II navigation receivers to supplement Class I navigation receivers due to the distance between navigational aids (navaids) and the limited width of airways. Class II en route navigation on international routes should be relatively simple, provided two conditions are properly addressed. The first condition is that, depending on the published route widths, length of flight, and type of Class II navigation equipment used, it may not be possible for an operator to maintain the course centerline accuracy required by the IS. Limitations

on the operation of some very low frequency (VLF)/Omega systems, as shown in the Flight Manual Supplement, may preclude their use in some areas of the IS. The second condition concerns the lack of VOR/distant measuring equipment (DME) transmitters, especially in the SFE, which means that special consideration must be given by operators to navigation accuracy requirements when using inertial reference systems (IRS) such as B-757, B-767, and A310. Again, it may not be possible to obtain the required navigation accuracy unless, considering the specific route and length of flight, VOR/DME updates are provided to the IRS.

j. Alternate Airports. For flight planning purposes, especially in the SFE, operators must give careful consideration to the location of, and routing to, suitable alternate airports. Fuel planning must be carefully considered due to potential difficulties with communications, diversion airport routings, and the lack of suitable airports in the SFE. It is not uncommon for the closest alternate airport to be over 500 nautical miles (NM) from a given destination.

k. Extended-Range Operations with Two-Engine Airplanes (ETOPS). Operations in the SFE with two engine aircraft may require ETOPS approval due to the lack of adequate/suitable airports within 60 minutes of the operator's route. AC 120-42, "Extended Range Operations with Two- Engine Airplanes," as amended, provides additional information.

l. IS Local Navigator Assistance. Navigation within the IS is the responsibility of the pilot-in-command (PIC). Flights operating off of established international routes, or on the domestic route system, usually are not permitted unless a local navigator is aboard. In unique situations, a radio operator will also be required; however, these two functions are usually performed by the navigator. The assistance of a navigator is also required for flights to or from any IS domestic airport. Although navigators may be required by the IS, they are not required flight crewmembers under the Federal Aviation Regulations (FAR) and are not responsible for the conduct of the flight. The navigator's purpose is to assist in cross-checking course information en route and to assist in cross-checking information on terminal arrivals, departures, and IAP's. FAA approval is required for U.S. operators to carry IS navigators/radio operators. The following information should also be considered when evaluating IS navigator/radio operator requirements:

(1) Due to the lack of informational and technical data pertaining to operations in the IS domestic systems which are needed to meet requirements of FAR Parts 121 and 135, it may not be possible for operators to conduct operations at most IS domestic airports.

(2) IS navigators are required to use a cockpit jumpseat, which may preclude an FAA inspector from accomplishing a required en route inspection or a validation test on a particular flight or series of flights.

(3) The charts for the IS domestic system are usually not available in English.

(4) The Russian MCA charges a substantial fee for the use of navigators and it is expected that other states will do the same when they have established their own Ministry of Civil Aviation.

m. Area of Magnetic Unreliability. Depending on the latitude of the routes flown, operations may be conducted within the IS area of magnetic unreliability.

n. Aeronautical Weather Data and NOTAM's. Aeronautical weather data and NOTAM's should be available in standard ICAO format through normal channels for all international airports within the IS. This data is normally not available for any airport within the domestic system. Within the IS, weather data and NOTAM's for airports within and outside the area is normally available from the weather service office at international airports. Extremely limited data is available at domestic airports within the IS and usually requires translation into English.

o. Terminal IAP's. Terminal IAP's at international airports within the IS are conventional and should not be confusing to foreign operators. Arrival and departure procedures are similar to U.S. standard terminal arrival routes (STAR) and standard instrument departures (SID). Radar vectoring is uncommon, so flight

crewmembers should expect to fly the full charted procedures published in the AIP or Jeppesen charts. Flight crewmembers should be aware that use of atmospheric pressure at airport elevation (QFE) is common and transition levels vary from one sector to another. IAP's are standard (instrument landing system (ILS), VOR, NDB) and, due to a lack of radar vectoring, full approaches (requiring a course reversal) are normally flown. Precision radar approaches are also very common throughout the IS. Terminal IAP's at domestic airports within the IS are usually not published in English or readily available to foreign air carriers. Operators must obtain the necessary data and comply with the appropriate FAR concerning routes, airports, weather, and communication. IS navigators, who are required for foreign aircraft operators within the domestic system, will carry en route, terminal area, and instrument approach charts for use within the domestic system. These charts are generally available in Russian only. STAR's, SID's, en route, terminal, and standard instrument approach (SIA) charts in English may be obtained from commercial sources and shall be utilized by the flightcrew during all operations. Class II navigation capability will likely be required for operators navigating within the domestic system due to the inability of foreign aircraft to receive signals from the IS VHF (RSBN) system. Many navaids (VHF [RSBN] and NDB) within the domestic system use identifiers that do not have an English translation.

p. Air Carrier Training Programs. Revisions to air carrier training programs and/or international procedures training for flight crewmembers may be required, prior to issuing operations specifications, in order to adequately address the unique environment of the IS. Appropriate information contained in the appropriate AIP relative to the country in which operations are to be conducted should be incorporated in air carrier training programs. Careful consideration should be given to training programs in the following areas:

- *Communications procedures* - Procedures to ensure communications are available between the aircraft and dispatch center must be included.

- *In-flight weather updates* - Flight crewmembers may require training on how to update en route and terminal area forecasts.

- *Metric conversions* - Flight crewmembers may require training in procedures to convert to or from the metric system.

- *Navigation procedures* - Depending on the geographic area of operations and navigation equipment used, flight crewmembers may require additional training on unique navigation systems and procedures.

- *Emergency procedures* - These procedures may require special attention due to airspace restrictions, limited alternate airports in certain locations, limited knowledge of domestic airports, limitations in IS air traffic controllers' ability to speak English, and in-flight emergency procedures within the IS.

q. Flight Approval. According to both the U.S.S.R. AIP and the International Flight Information Manual (IFIM), an operator must receive written approval from MCA-Moscow before initiating a flight which will enter Russian airspace. Operators shall not request flight approval through any regional ministry or Aeroflot office. Any approval granted by a regional office should not be considered sufficient unless accompanied by approval from MCA-Moscow. Aircraft operators intending to utilize standard air corridors and international airports in the IS should submit their request via telex directly to the MCA for Russian operations, far enough in advance so as to reach the ministry at least 5 working days (3 weeks suggested) before departure. For other IS, the same procedure should be used if a Ministry of Civil Aviation exists. It is recommended at this time that the embassy of the state in question be contacted to obtain the status of their civil aviation control.

If an embassy is not available, the Russian Embassy can supply information regarding the procedures to be used.

MCA - Russia
Telegraphic Address:
International Department
Ministry of Civil Aviation
Leningradsky Prospect 37
Moscow
Telex: 411182 AFL SU

It is recommended that a simultaneous request be made to the Central Department of Operational Services (CDOS).

Telegraphic Address:
Central Department of Operational Services
Telex: 412303 CDS SU
ATTN: UUUUYAYW
SITA: MOWZGSU

Operator requests to use nonstandard routings and/or land at airports normally serving domestic traffic should be submitted through the Economic Section of the U.S. Embassy in Moscow, APO, NY, 09862 (Telegraphic address: Amembassy Moscow, Telex: 413160 USGSO SU). Information to be included in the telex is listed in the AIP and IFIM. Recent operator experience indicates that the communication infrastructure may preclude receiving this authority in a timely manner. Personal presentations, including objectives and justification, may be more effective.

*r. **Validation Flight Requirements.*** Validation flights are required for all U.S. operators seeking approval to operate within IS airspace. Validation flights are also required for any operator seeking a significant expansion in service or operating area within the IS. Some examples of situations requiring validation flights include the following:

- An air carrier previously serving in the western IS that desires to operate east of the Ural mountains
- An air carrier approved to serve a coastal airport only that desires to expand service to inland airports
- An air carrier that has not operated within the IS within the past 6 months
- Any proposed operation that requires the use of an IS navigator
- Any other situation that the FAA determines is necessary to ensure a safe operation

Validation flights may be conducted with revenue passengers or cargo aboard, unless special situations dictate otherwise. The following items will be considered during validation flights:

- Flight approval
- Adequacy of FAR 121.445 special airport qualification procedures
- Flight planning and flight release/dispatch procedures, when applicable
- Contingency planning - alternate airports for takeoff, en route, and destination
- Communication and navigation procedures
- IAP's
- Data communications with IS (telex, ATTN, SITA)
- Weather and NOTAM availability within the IS

- Fueling and cargo loading procedures

In view of the problems described in the preceding areas of consideration, it may be beyond the capabilities of many operators to conduct operations to most IS domestic airports at this time.

3. OPERATIONS TO THE FORMER REPUBLIC OF YUGOSLAVIA.

Under the provisions of United Nations Security Council (UNSC) Resolution 757 (1992), U.N. member states are required to prohibit takeoffs, landings, and overflight of their territories by aircraft flying to or from the Federal Republic of Yugoslavia, including Slovenia, Croatia, Bosnia-Herzegovina, Macedonia, Serbia (including the provinces of Vojvodina and Kosovo), and Montenegro. Flights which operate into the Federal Republic of Yugoslavia under this operating limitations policy must conform with SFAR No. 66. The PIC must receive an intelligence briefing from the Air Mobility Command (AMC) for each flight to any of the airports located in that geographic area.

Air carriers should observe the following precautions:

(1) Current intelligence information must be obtained from AMC regarding the best arrival and departure routes and the minimum safe altitude (safe from hostile acts) to maintain at various points along the route.

(2) Obtain current intelligence information from AMC regarding safe diversion airports and routes.

(3) If AMC determines that navaid interference and ATC voice communication intrusions can be expected, the air carrier must develop countermeasure procedures and train flightcrews in their use.

(4) If the authority controlling operations into a particular airport has procedures for communicating emergency diversion information over air/ground communication systems, the air carrier must obtain call signs and frequencies for dissemination to flightcrews.

When planning a flight to the hostile area, the flightcrew should check current NOTAM's for the most current information. Flightcrews should also observe the following precautions.

(1) Before each flight into a hostile area airport, the flightcrew must obtain a current intelligence briefing from AMC regarding the best routes and minimum altitudes to avoid known and possible threats.

(2) The briefing must be given at the airport where the flight departs for the hostile area airport, and shall be given when the flightcrew reports for duty to prepare for the final leg of the flight.

(3) Before the flight is authorized to depart, the flightcrew must ensure that the briefer provides at least the following information:

(a) The flightcrew must be informed of known or suspected threats located relatively close to the arrival and departure routes, available diversion routes, and the destination airport.

(b) If known or suspected threats are located relatively close to arrival, departure, or diversion routes, or to the airport, the pilot must be advised whether or not it would be prudent to revise the planned routes and/or altitude.

(c) Any reports of intentional navaid interference or ATC voice intrusions should be communicated to the flightcrew before departure.

(d) The flightcrew must receive updated information on emergency diversion procedures and call signs and frequencies of air/ground communication stations that issue emergency diversion advisories.

U.S. air carriers who have contracted with AMC to conduct operations into the former Yugoslavia must ensure that their operators comply with the preceding information. U.S. air carriers who do not have contracts with AMC to conduct such operations must ensure that the operations conform to SFAR No. 66. Air carrier operations must be conducted in accordance with all pertinent sections of FAR Part 121 and the air carrier's

operations specifications at all times. U.S. air carriers who have contracted with AMC to conduct operations to any airport located in the former Republic of Yugoslavia shall amend paragraph C67 of the operations specifications by listing the airports to which such operations are authorized. Also, paragraph C67 must be amended to include a limitation prohibiting operations to such airports unless the requirements of this section have been met.